



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
ARIZONA ECOLOGICAL SERVICES FIELD OFFICE  
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2-21-91-F-054

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May 7, 1993

Larry Henson  
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517 Gold Ave., SW.  
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Dear Mr. Henson:

This biological opinion responds to your request of October 9, 1992 for formal consultation pursuant to section 7 of the Endangered Species Act (Act) of 1973, as amended, on the Campbell and Isabelle Timber Sales on the Alpine Ranger District of the Apache-Sitgreaves National Forests, Apache and Greenlee Counties, Arizona. The species of concern are the threatened loach minnow (Tiaroga cobitis) and Apache trout (Oncorhynchus apache). The Mexican spotted owl (Strix occidentalis lucida), which was listed on March 16, 1993 (effective April 15, 1993) will be addressed in a separate formal consultation.

The 90-day consultation period began on October 13, 1992, the date your request was received by the Fish and Wildlife Service (Service). The consultation period was extended until March 27, 1993 to allow time for additional information on the Campbell Timber Sale to be provided and to allow for the addition of the adjacent Isabelle Timber Sale to the action under consultation.

This biological opinion is based on information provided by the following:

- biological evaluation (undated) and supplements 1, 2 and 3 for the Campbell Timber Sale (referred to collectively as the Campbell BE),
- draft Campbell Timber Sale Environmental Assessment (undated) and supplements 2 (April 17, 1992) and 2 (September 18, 1992) (referred to collectively as the Campbell EA),
- Watershed Cumulative Effects Analysis for Campbell Timber Sale Area/Campbell Blue Watershed (WCEA),
- Fuel Treatment Plan and Appraisal for the Campbell Timber Sale (fuel plan),
- biological evaluation for the Isabelle Timber Sale (undated) (Isabelle BE),
- Isabelle Timber Sale Environmental Analysis (August 1990) (Isabelle EA),
- telephone update (May 5, 1993) of project information with Cindy Calbaum, Forester,
- data in our files, and
- other sources of information.

## BIOLOGICAL OPINION

It is my biological opinion that Campbell and Isabelle Timber Sales are not likely to jeopardize the continued existence of loach minnow or Apache trout and are not likely to destroy or adversely modify the proposed critical habitat of loach minnow.

## BACKGROUND INFORMATION

Species Descriptions

## Loach Minnow

The loach minnow was listed as a threatened species on October 28, 1986 (USFWS 1986). Critical habitat was proposed on June 18, 1985, for portions of the Gila, San Francisco and Tularosa Rivers and Dry Blue Creek in New Mexico; and the Blue and San Francisco Rivers, Aravaipa and Campbell Blue Creeks in Arizona (USFWS 1985). That proposal is still pending.

Due to numerous new threats developing throughout its range, the status of the loach minnow is deteriorating. The Service's Albuquerque Regional Office and the Desert Fishes Recovery Team have recommended that the species be uplisted to endangered. A proposal for reclassification has not yet been prepared or published due to work on other higher priority listing actions.

Historical range of loach minnow included the basins of the Verde, Salt, San Pedro, San Francisco, and Gila Rivers (Minckley 1973). Competition and predation by non-native fish and habitat destruction have reduced the range of the species by more than 85 percent (USFWS 1986). The five remaining populations of loach minnow are found in limited portions of the upper Gila, San Francisco, Blue, Tularosa, and White Rivers; and Aravaipa, Campbell Blue, and Dry Blue Creeks in Arizona and New Mexico (USFWS 1991).

The population of loach minnow in Campbell Blue Creek is within the action (affected) area of the proposed Campbell and Isabelle Timber Sales. Distribution information for the loach minnow population in Campbell Blue Creek is limited. Records for loach minnow in Campbell Blue Creek are distributed from near Cat Creek downstream to the mouth [Silvey and Thompson 1978; Sheldon and Hendrickson 1988; Arizona Game and Fish Department (AGFD) Heritage database; Kirk Young, AGFD, field notes October 22, 1992]. Critical habitat was proposed for loach minnow in June 1985 (USFWS 1985) and included Campbell Blue Creek from the confluence with Coleman Creek downstream to the confluence with the Blue River.

Loach minnow are bottom-dwelling inhabitants of shallow, swift water over sand, gravel, cobble, and rubble substrates (Rinne 1989, Propst and Bestgen 1991). Loach minnow use the spaces between, and in the lee of, larger substrate for resting and spawning (Propst *et al.* 1988, Rinne 1989). They are rare or absent from habitats where fine sediments fill the interstitial spaces (Propst and Bestgen 1991). Some studies have indicated that the presence of filamentous algae may be an important component of loach minnow habitat (Barber and Minckley 1966).

The life span of loach minnow ranges from 1.5 years to 3 years, with most surviving about 2 years (Britt 1982, Propst and Bestgen 1991). Loach minnow feed exclusively on aquatic insects (Schrieber 1978, Abarca 1987, Propst and Bestgen 1991). Spawning occurs in March through May (Britt 1982, Propst et al. 1988); however, recent reports have confirmed that under certain circumstances loach minnow also spawn in the autumn (Vives and Minckley 1990). The eggs of loach minnow are attached to the underside of a rock that forms the roof of a small cavity in the substrate on the downstream side. Limited data indicate that the male loach minnow may guard the nest during incubation (Propst et al. 1988, Vives and Minckley 1990).

#### Apache Trout

The Apache trout is a species of interior Western trout, medium in size with no red or pink lateral band and a yellow to yellowish-olive ground color. Small dark spots are scattered over the dorsal and lateral surfaces. The dorsal, pelvic, and anal fins have a conspicuous cream or pale yellowish tip. Background information on this species was taken from the Apache Trout Recovery Plan (USFWS 1983) and further information on the species may be found there.

The Apache trout was not recognized as a distinct species until 1972, although it had been recognized as being in need of special management as early as the 1940's and 1950's. Efforts to conserve the species were undertaken by the White Mountain Apache Tribe, AGFD, and Service. In 1967, the Apache trout was included on the Secretary of the Interior's list of rare and endangered species. With the passage of the Act in 1973, the species was included on that list as an endangered species. Conservation and recovery efforts enabled the Apache trout to be downlisted to threatened status on July 16, 1975 (USFWS 1975). Under a special rule, State regulations to allow for recreational take of the Apache trout were allowed. No critical habitat is designated for Apache trout.

The Apache trout is native to the headwaters of the White, Black, and Little Colorado Rivers of the White Mountains of Arizona. Once very abundant in these watersheds, the introduction of nonnative species, such as the rainbow (Oncorhynchus mykiss), brown (Salmo trutta), and brook (Salvelinus fontinalis) trouts had significant adverse effects to the native trout populations. Competition for space in the streams and rivers of the montane country resulted from the heavy and continued stocking of these waters with nonnative trout for recreational fishing. Another significant impact was the hybridization between the rainbow and Apache trout that resulted in genetic swamping of the native genotypes. Determining which of the remaining populations of Apache trout were genetically pure and could be used in restocking recovery efforts has hampered those efforts. The recent completion of genetic surveys on Apache trout populations will clarify this situation. The 1983 recovery plan (USFWS 1983) said there were fewer than 30 stream miles of genetically pure Apache trout, down from an estimated historical distribution of 600 stream miles. Recovery efforts since 1983 have increased the extent of the existing pure populations. The plan identified a goal of 30 pure strain, self-sustaining populations of Apache trout on Forest Service and White Mountain Apache Reservation lands as the criteria to delist the species.

Apache trout are similar to other trout in their habitat requirements. Competition with nonnative trout is considered a factor in the retreat of Apache trout to the very small headwater streams from their historically wider distribution in the drainages. These streams do not likely represent ideal Apache trout habitats and inference of specific habitat preferences from these areas may be difficult. Measures of habitat quality in these areas can, and have, been made and contribute significantly to assessment of management needs.

Apache trout are not found on or downstream from the Campbell Timber Sale. They are found in Coleman Creek, on the northeastern boundary of the Isabelle Timber Sale. Apache trout may have been native to the upper Blue River drainage, but the present population in Coleman Creek originated from a 1981 stocking (USFWS 1983). Despite containing 1.9 miles of stream reach in unsatisfactory riparian/aquatic condition, Coleman Creek supports a small self-sustaining population of Apache trout which is considered to be important to the recovery effort for that species (Novy and Lopez 1991).

#### Project Description

The proposed Campbell and Isabelle Timber Sales are located along the upper reaches of Campbell Blue Creek. The sale area is gently sloping terrain with vegetation being predominantly ponderosa pine (*Pinus ponderosa*) and screwleaf muhly (*Muhlenbergia virascens*). Campbell Blue Creek is a perennial tributary of the Blue River in Apache and Greenlee Counties, Arizona. It is located within the Alpine Ranger District of the Apache-Sitgreaves National Forests. Perennial flow begins near the crossing of U.S. Highway 666, at the division between the Campbell and Isabelle sale areas. In addition to Campbell Blue Creek, other perennial or intermittent drainages include Cienega, Coleman, Buckalou, and Castle Creeks.

The proposed Campbell Timber Sale is located on both sides of Campbell Blue Creek in townships 4, 4 1/2, and 5 North, ranges 29 and 30 East (Figure 1), approximately 5 miles southwest of Alpine, Arizona. The sale area is bounded by Middle Mountain on the south and west, Turkey Creek and U.S. Highway 666 on the east, and Tenney Mountain on the North. Harvest is expected to occur in 1994. The preferred alternative (B) would provide for harvest of approximately 3.298 million board feet (MMBF) of sawtimber and 700 cords of pulpwood. The sale area covers approximately 5,416 acres with approximately 2,793 acres (52 percent) on which harvest would occur. Timber harvest would be accomplished using tractor logging and would include shelterwood seed cuts, groups shelterwood seed cuts, intermediate cuts, and sanitation salvage cuts. Buffer zones of 132 feet, where no cutting is allowed, would be maintained on all creeks and drainages in the sale area.

As part of the Campbell Timber Sale, 0.22 miles of new road would be constructed. An additional 13.42 miles of existing roads would be used during the sale and kept open for public use following the sale, and 13.49 miles of existing roads would be used and then closed to all use following the sale. An existing 29.01 miles of road in the sale area would not be used during the timber harvest. Of those 29.01 miles, 4.01 miles would remain open for public use and 25 miles would be closed using Knutson-Vandenberg Act (KV) funds received from sale receipts. All closed roads and all skid trails would be reseeded following the harvest. Small roadside tanks or basins would be constructed to trap sediment and runoff

from roads and to provide water for use by livestock and wildlife. These tanks would not sustain permanent year-round water.

Fuel treatment would occur following the harvest on the Campbell Timber Sale. The sale is expected to raise the existing fuel loading from a pre-sale average of 12.8 tons per acre to a post-sale average of 14.3 tons per acre. Treatment would include 51 acres of hand piling, 51 acres of Jackpot Machine piling, 202 acres of slash pile burning, 1,138 acres of slash hazard broadcast burning, 542 acres of lopping slash to 2 feet, 599 acres of regeneration broadcast burning using KV funds, and 1,527 acres forage improvement broadcast burning using KV funds. All prescribed burning would be conducted during the fall months (October-November). Where possible existing roads would be used for control lines rather than constructing new control lines with bulldozer and plow. Control lines constructed by bulldozer on slopes over 10 percent would have water bars installed and be seeded with grass following the burn. A 132 foot unburned buffer zone would be maintained on all drainage bottoms.

The use of KV funds from the Campbell Timber Sale is proposed for fencing along Campbell Blue Creek to exclude livestock use and for construction of instream structures designed to raise the watertable to historical levels. Specific location and design criteria for these projects have not yet been proposed. Therefore, these projects are not a part of this consultation and would require additional formal section 7 consultation if they may affect loach minnow and its proposed critical habitat or any other listed species.

Monitoring measures proposed as part of the Campbell Timber Sale include the continuation of the flow gauge on Campbell Blue Creek, annual surveys of loach minnow distribution and habitat conditions in Campbell Blue Creek for five years, pre- and post-harvest collection of macro-invertebrate samples at six sites on Campbell Blue Creek, and other monitoring as appropriate. This monitoring would be conducted in cooperation with AGFD.

The proposed Isabelle Timber Sale is located on both sides of Campbell Blue Creek in townships 4 and 4 1/2 North, ranges 30 and 31 East (Figure 1), approximately 5 miles southwest of Alpine, Arizona. It is adjacent to, and immediately downstream from, the Campbell Timber Sale. The sale area is bounded on the west by U.S. Highway 666, Coleman Creek on the east, and Buckalou Creek on the south. The preferred alternative (U) would provide for harvest of approximately 5.66 MMBF of sawtimber. The sale area covers approximately 7,796 acres with approximately 1,995 acres (26 percent) on which harvest would occur. Timber harvest would be accomplished using tractor logging and would include shelterwood seed cuts, shelterwood final removal cuts, and intermediate cuts. No buffer zones along drainages are specified. No cutting units are located immediately adjacent to Coleman or Buckalou Creeks. Cutting units do abut Campbell Blue and Castle Creeks. Although the Isabelle EA states "no harvesting on slopes adjacent to Coleman Creek, the Campbell Blue River, Buckalou Creek or any side drainages," this applies only to "steep" slopes and harvesting would actually occur next to the streams in three stands.

As part of the Isabelle Timber Sale, 1 mile of new road would be constructed, but would be closed to use after the sale. An additional 22 miles of existing roads would be reconstructed for the sale and maintained

during the sale. They would apparently be kept open for public use following the sale.

To facilitate regeneration of ponderosa pine on the Isabelle Timber Sale, 110 acres in the sale area would be mechanically scarified following the harvest. This acreage would coincide with stands that are planned for machine piling. Fuel treatment would also occur following the harvest. Treatment would include 553 acres of prescribed burning. Conditions or restrictions on the management of this burning are not specified in the Isabelle BE or EA and buffer zones for drainages are not specified.

The use of KV funds from the Isabelle Timber Sale is proposed for seeding and three water catchments. The water catchments would be roofed fiberglass catchments with piping to drinkers.

No monitoring of stream flow, sediment, wildlife, fish, or riparian vegetation is proposed as part of the Isabelle Timber Sale.

#### EFFECTS OF THE ACTION

##### Environmental Baseline

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have already undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat to provide a platform to assess the effects of the action now under consultation.

The watershed of Campbell Blue Creek has been subjected to numerous private, State, and Federal actions over the years. Past timber sales, livestock grazing, roads, gravel and mineral mining, and other actions have affected the watershed. Turbidity and sedimentation are relatively high in the watershed. Forest Service data on Campbell Blue Creek shows an average turbidity of 17.4 nephelometric turbidity units (NTU's) in high flow event grab samples from 1980 to 1985 and an average of 19.8 NTU's in automatic sampling of high flow events during 1984-85 (WCEA). The Arizona state standard for maximum turbidity in cold water aquatic systems is 10 NTU's.

According to Forest Service information (Campbell EA) the condition of the riparian vegetation along upper Campbell Blue and Cienega Creek is in poor condition, downcutting of stream channels has occurred and the watertable has dropped 8 to 10 feet. Existing roads within the Campbell Timber Sale area are in poor condition and many are severely eroded causing increased runoff and sedimentation into the drainages. Except for the streams and roads, watershed conditions in the upper Campbell Blue Creek watershed are generally satisfactory (WCEA). However, in the lower portion, watershed conditions are poor and may contribute to sediment loads.

The upper 1.9 miles of Coleman Creek are in unsatisfactory condition for riparian and aquatic values. Portions of these reaches have recently been fenced to exclude livestock grazing. Erosion of streambanks is a concern, as is sediment inflow from the watershed.

past timber sales which have occurred in the Campbell Blue Creek drainage include the Tenney (1991-92), Cat (1988), Castle (1990), and Prime (1987) sales. Information on earlier harvests on the four sale areas mentioned above and on the Campbell and Isabelle sale areas is not available.

#### Direct and Indirect Effects of the Proposed Action

The Campbell and Isabelle Timber Sales are expected to have direct effects on both the loach minnow and the Apache trout. Effects to loach minnow would be similar on both sale areas. For Apache trout, only the Isabelle Timber Sale would affect the species.

Because the loach minnow is a bottom-dwelling species which uses the interstitial spaces of the stream substrate, it is vulnerable to deposition of sediment (Propst and Bestgen 1991). The proposed Campbell and Isabelle Timber sales would add to the already elevated turbidity and sediment loads in Campbell Blue Creek. This effect would be partially alleviated by the proposed protection of 132 feet of buffer zone along streams and drainages in the Campbell Sale area. The increase in disturbed area on the Campbell Timber Sale is estimated in the Campbell EA to be 6.23 percent, increasing from the 4.02 percent currently disturbed to 10.25 percent. Similar figures are not given for the Isabelle sale, but the Isabelle EA states that "Some soil loss which is irreversible and irretrievable would occur. . .", although soil loss is expected to be "minor."

Loach minnow and their habitat would also be affected by changes in the quantity and timing of water flows in the watershed as a result of the Campbell and Isabelle Timber Sales. Increases in peak flow would result in alterations of channel morphology and may cause increased channel erosion. These changes may alter availability and distribution of loach minnow habitat. Increases in peak flows would occur because of decreased retention of water in the soils of the watershed and increased overland flows, a common aftermath of timber harvest (Brown *et al.* 1974, Heede and King 1990, Chamberlin *et al.* 1991). Increases in water yield due to the Campbell Timber Sale are predicted to be 4.5 percent with a 6.1 percent increase in peak flows, and increases in water yield within the Campbell Blue watershed as a result of the Campbell, Isabelle and 4 other timber sales are predicted to be 2.9 percent with a 4.1 percent increase in peak flow (WCEA). These increases are substantially lower than water yield increases found in studies of nearby White Mountain and other Arizona drainages, such as Castle Creek (29 percent), Thomas Creek (45 percent), Willow Creek (54 percent), and Workman Creek (110 percent) (WCEA), apparently because of the small volume of harvest per acre on the Campbell and Isabelle Sales.

Reduced water retention and increased peak flows would produce a corresponding decrease in base flows and low summer flows. Low flows in Campbell Blue Creek may be a limiting factor on the loach minnow population and even small decreases in those low flows may have serious adverse effects to the population. No data are available regarding the expected decreases in low flow due to the alteration in runoff patterns.

The broadcast and prescribed burning which would occur in both the Campbell and Isabelle Timber Sales may adversely affect the loach minnow in several ways. The burns would accentuate the increases in peak flows, decrease base flows, and increase in sediment already predicted as a result of the

timber harvest itself (Hibbert 1983, Ffolliott and Thorud 1975, A. Medina, USFS, pers. comm. September 1991). Runoff and ash deposition from nearby burns may result in mechanical damage or toxicity to fish (Spencer and Hauer 1991, Propst *et al.* 1992). Burn areas are planned on or near the major drainages on both the Campbell and Isabelle Timber Sales.

The adverse effects expected to Apache trout would occur through the same mechanisms as those for loach minnow. Sediment transport into the stream alters Apache trout habitat, filling resting and hiding areas and suffocating spawning areas. Increased peak flows would cause habitat damage and decreased low flows would reduce habitat availability and may cause direct mortalities. Burning would exacerbate the previously mentioned effects and may cause fish death through mechanical damage and toxicity. A wildfire in New Mexico in 1989 caused a major fish kill of the endangered Gila trout (*Oncorhynchus gilae*) (Propst *et al.* 1992). Because of the steep streamside topography on Coleman Creek, no harvest or burning are planned immediately adjacent to the creek. This is likely to ameliorate most of the adverse effects to Apache trout from the Isabelle Timber Sale.

#### Cumulative Effects of the Proposed Action

Cumulative effects are those effects of future non-Federal (State, local government, or private) activities on endangered or threatened species or critical habitat that are reasonably certain to occur during the course of the Federal activity subject to consultation. Future Federal actions are subject to the consultation requirements established in section 7 and, therefore, are not considered cumulative in the proposed action.

Existing roads and off-road use in the upper Campbell Blue basin are contributing substantially to sediment transport and erosion problems. Use of KV funds to close and repair roads in this area should result in benefits to the loach minnow and Apache trout.

Private actions are limited in the Campbell Blue watershed because most of the land is within the Apache-Sitgreaves National Forests. Two private inholdings are located on Campbell Blue Creek. These lands are used for ranching and private residence.

#### INCIDENTAL TAKE

Section 9 of the Act, as amended, prohibits any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish and wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered a prohibited taking provided that such taking is in compliance with the incidental take statement. The measures described below are nondiscretionary, and must be undertaken by the agency or made a binding condition of any grant or permit issued to the applicant, as appropriate.

The Service anticipates that the proposed Campbell and Isabelle Timber Sales would result in incidental take of loach minnow and Apache trout through direct mortality of fish and through destruction and modification of habitat resulting in loss of fish and impairment of reproduction. Because of the limited data available on the populations of both species and because of the population fluctuations inherent in a short-lived species such as loach minnow, incidental take cannot be quantified in terms of numbers of individuals taken. Therefore, incidental take will be assumed to have exceeded anticipated levels if the following circumstances occur:

1. More than 10 dead fish (of any species) are found in Campbell Blue or Coleman Creeks within or downstream from the sale area during logging, post-sale, or fuel treatment activities.
2. Turbidity, sediment, water yield, or peak flow increases exceed levels predicted in the WCEA by greater than 15 percent.
3. Stream channel downcutting and bank erosion increases over pre-harvest levels.

If, during the course of the action, the amount or extent of the incidental take limit is exceeded, the Forest Service must reinitiate consultation with the Service immediately to avoid violation of section 9. Operations must be stopped in the interim period between the initiation and completion of the new consultation if it is determined that the impact of the additional taking will cause an irreversible and adverse impact on the species. The Forest Service should provide an explanation of the causes of the taking.

#### Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the incidental taking authorized by this biological opinion.

1. Conduct all proposed actions in a manner which will minimize direct mortalities of loach minnow and Apache trout.
2. Conduct all proposed actions in a manner which will minimize modification and loss of loach minnow and Apache trout habitat.
3. Maintain a complete and accurate record of actions which may result in take of loach minnow, Apache trout, or their habitats.
4. Monitor loach minnow, Apache trout, and their habitats to document levels of incidental take of fish or their habitat.

#### Terms and Conditions for Implementation

In order to be exempt from the prohibitions of section 9 of the Act, the Forest Service is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions apply to both the Campbell Blue and Isabelle Timber Sales.

1. Use of mechanized vehicles within the channels of Campbell Blue Coleman, Cienega, Buckalou, and Castle Creeks for logging, post-harvest, or fuel treatment activities shall occur only at designated crossings. Crossing width shall be limited to the minimum necessary to accommodate the equipment being used. No more than seven total crossings shall be designated, with no more than three of those located on Campbell Blue Creek (excluding Highway 666).
2. All perennial, intermittent, and ephemeral drainages (all drainages depicted as watercourses on USGS topographic quad maps) within the sale areas shall be considered watercourses. No timber harvest, vehicle use, post-harvest, or fuel treatment activities shall occur within a buffer of 132 feet on either side of any watercourse (measured from channel center). The only exception to the buffer zones are the designated crossings specified under term and condition 1.
  3. Logging, post-harvest, and fuel treatment activities shall be conducted in a manner to ensure that no pollutants (excluding sediment) enter any watercourse within the Campbell Blue drainage.
  4. During all logging, post-sale, and fuel treatment activities, downstream areas of Coleman and Campbell Blue Creeks shall be surveyed to check for dead or dying fish or other signs of take. Daily checks of the creeks shall be made if work is occurring and if surface flow is present within 1/2 miles of the activity. Sites to be checked shall be at the discretion of the Forest Service, but shall be selected to give a high probability of detecting fish mortalities from sale and post-sale activities.
  5. A written record of the harvest and post-harvest activities shall be maintained, including documentation of the differences between the planned activity and the activity as it actually took place. A report shall be submitted to the Service within 90 days of completion of harvest activities, within 90 days of any burn activities, and as a yearly summary.
  6. Monitoring of loach minnow and Apache trout and their habitats in Coleman and Campbell Blue Creeks shall be conducted before and after commencement of any on-ground sale activity. Habitat monitoring shall include stream channel morphology, substrate embeddedness, riparian vegetation, and other appropriate factors and shall be conducted once prior to sale activities, once following completion of all harvest, post-harvest, and fuel treatment activities, and no less than once every two years during those activities. Fish monitoring shall include presence and distribution of loach minnow and Apache trout, with age structure data also collected for Apache trout. Fish monitoring shall be conducted a minimum of twice yearly during harvest, post-harvest, and fuel treatment activities. Following the end of those activities, monitoring shall be conducted at least once a year for a minimum of five years following the end of all sale activities. Monitoring protocol shall be mutually acceptable to the Forest Service, AGFD and Service. Monitoring results shall be furnished to the Service within 90 days after completion of each monitoring effort.

7. Operation of the flow gauges on Campbell Blue and Castle Creeks shall be continued through the life of the fish monitoring activities. Gauge data shall be furnished to the Service every three months during sale activities and on a yearly basis thereafter. If gauge data indicate anticipated incidental take levels are being exceeded, the Service should be notified by telephone as soon as possible.

8. Turbidity levels shall be monitored in Campbell Blue Creek, as close to the downstream end of the Campbell Timber Sale area as reasonably possible, to record changes in levels following the sale activities and to detect any exceedance of incidental take levels. Because of difficulties in sediment monitoring, sediment levels may be inferred from turbidity data. Sediment and turbidity monitoring of the Isabelle Timber Sale will not be required because of the lack of appropriate baseline and future stream-flow data to interpret monitoring data. Channel shape, size, and stability shall be monitored in Campbell Blue Creek to detect if channel downcutting or bank erosion increases following sale activities. This monitoring shall continue through the life of the fish monitoring activities. A report of the monitoring shall be furnished to the Service every three months during sale activities and on a yearly basis thereafter. If monitoring data indicate anticipated incidental take levels are being exceeded, the Service should be notified by telephone as soon as possible.

#### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term conservation recommendations has been defined as Service suggestions regarding discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's 7(a)(1) responsibility for these species.

The Service supports the use of KV funds to restore and enhance riparian and instream habitat in upper Campbell Blue Creek. We recommend that the fencing, instream structures, and other erosion control and watershed restoration actions considered as part of the Campbell Timber Sale be cooperatively planned by the Forest Service, AGFD, Service, and appropriate academic specialists. Such an approach would help ensure that the best available information is used in the planning to benefit the watershed, riparian vegetation, and the fish community. The Service anticipates that these activities, if carefully planned, could greatly benefit the loach minnow and the native fish community. Due to the lack of project specifics, the proposed fencing and instream structures could not be evaluated in this consultation and additional formal consultation will likely be required. Service involvement in planning these efforts will expedite the formal consultation process.

In order for the Service to be kept informed of actions that either minimize or avoid adverse effects or that benefit listed species or their

habitats, the Service requests notification of the implementation of any conservation recommendations.

## CONCLUSION

This concludes formal consultation on the Campbell and Isabelle Timber Sales. As required by 50 CFR 402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

We appreciate your efforts toward the conservation of endangered and threatened species. If we can be of further assistance, please contact Sally Stefferud or Tom Gatz.

Sincerely,



Sam F. Spiller  
State Supervisor

cc: Director, Arizona Game and Fish Department, Phoenix, AZ  
Regional Supervisor, Arizona Game and Fish Department, Pinetop, AZ  
Regional Director, Fish and Wildlife Service, Albuquerque, NM  
(AES)  
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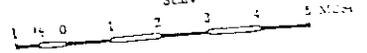
CAMPBELL TIMBER SALE

ALPINE RANGER DISTRICT  
APACHE NATIONAL FOREST

ARIZONA

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Scale



LEGEND

- Ranger District Boundary
- National Forest Land







UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
ARIZONA ECOLOGICAL SERVICES STATE OFFICE  
3616 West Thomas Road, Suite 6  
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2-21-91-F-054

March 18, 1994

Larry Henson  
U.S. Forest Service  
517 Gold Ave., SW  
Albuquerque, New Mexico 87102

Dear Mr. Henson:

The May 7, 1993, biological opinion/conference report which concluded formal consultation/conference under the Endangered Species Act found that the proposed Campbell and Isabelle Timber Sales on the Alpine Ranger District of the Apache-Sitgreaves National Forests, Apache and Greenlee Counties, Arizona, were not likely to destroy or adversely modify the proposed critical habitat of the threatened loach minnow (Tiaroga cobitis). The proposed critical habitat for the loach minnow was made final on March 8, 1994 (59 FR 10898-10906). This letter amends the biological opinion to convert the conference finding on the proposed critical habitat to a consultation finding that the two timber sales are not likely to destroy or adversely modify the designated critical habitat of loach minnow.

No further section 7 consultation on these projects for the loach minnow is needed unless changes in the project or available information indicate effects to the species or its critical habitat not considered in the original opinion/conference report, if other species or critical habitats have been listed in the project area since that opinion, or if the amount or extent of incidental take may be exceeded.

If we can be of further assistance, please contact Sally Stefferud or Tom Gatz

Sincerely,

Sam F. Spiller  
State Supervisor

cc: Director, U.S. Fish and Wildlife Service, Washington, D.C. (DES)  
Regional Director, U.S. Fish and Wildlife Service, Albuquerque,  
New Mexico (AES)  
State Supervisor, U.S. Fish and Wildlife Service, Albuquerque,  
New Mexico  
Director, Arizona Game and Fish Department, Phoenix, Arizona  
Forest Supervisor, U.S. Forest Service, Springerville, Arizona  
District Ranger, U.S. Forest Service, Alpine, Arizona  
Project Leader, U.S. Fish and Wildlife Service, Pinatop, Arizona